

wherein said channel forming region has no grain boundary, and

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said semiconductor island includes a spin density not higher than $1 \times 10^{17} \text{ cm}^{-3}$,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing a point defect in the crystalline semiconductor island,

wherein the thin film transistor is a p-channel thin film transistor or an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm^2/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm^2/Vs .

80. (Twice Amended) A thin film transistor comprising:

a crystalline semiconductor island on an insulating surface;

source and drain regions in said semiconductor island;

a channel forming region between said source and drain regions;

a gate insulating film on at least said channel forming region;

a gate electrode over said channel forming region having said gate insulating film therebetween,

wherein said channel forming region has no grain boundary, and

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said semiconductor island includes a point defect of $1 \times 10^{16} \text{ cm}^{-3}$ or more, and one of hydrogen and halogen element for neutralizing the point defect at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$,

wherein the thin film transistor is a p-channel thin film transistor or an n-channel thin film transistor,

*mrg
JZ Conf
cond.*
wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm²/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm²/Vs.

MJ3
87. (Twice Amended) A semiconductor device comprising:

a crystalline semiconductor island on an insulating surface;
source and drain regions in said semiconductor island;
a channel forming region between said source and drain regions;
a gate insulating film adjacent to at least said channel forming region;
a gate electrode adjacent to said channel forming region having said gate insulating film therebetween,

JZ3
wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than 5×10^{18} cm⁻³, and oxygen at a concentration not higher than 5×10^{19} cm⁻³,

wherein said crystalline semiconductor island is formed in a monodomain region which contains no grain boundary,

wherein one of hydrogen and halogen element at concentration not higher than 1×10^{20} cm⁻³ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm²/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm²/Vs.

JZ4 mrg JZ4
93. (Amended) A semiconductor device comprising:

a crystalline semiconductor island on an insulating surface;
source and drain regions in said semiconductor island;
a channel forming region between said source and drain regions;
a gate insulating film adjacent to at least said channel forming region;
a gate electrode adjacent to said channel forming region having said gate insulating film therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said channel forming region is formed in a monodomain region which contains no grain boundary,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm^2/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm^2/Vs .

99. (Twice Amended) A semiconductor device comprising:

a p-channel thin film transistor;

an n-channel thin film transistor;

each of said p-channel thin film transistor and said n-channel thin film transistor

comprising:

a crystalline semiconductor island on an insulating surface;

source and drain regions in said semiconductor island;

a channel forming region between said source and drain regions;

a gate insulating film adjacent to at least said channel forming region;

a gate electrode adjacent to said channel forming region having said gate insulating film therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said crystalline semiconductor island is formed in a monodomain region which contains no grain boundary,

15 Con'd.
wherein said crystalline semiconductor island include one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the p-channel thin film transistor has a mobility in a range of $200\text{-}400 \text{ cm}^2/\text{Vs}$ while the n-channel thin film transistor has a mobility in a range of $500\text{-}1000 \text{ cm}^2/\text{Vs}$.

Su
Sp
16
105. (Twice Amended) A semiconductor device comprising:

a p-channel thin film transistor;

an n-channel thin film transistor;

each of said p-channel thin film transistor and said n-channel thin film transistor

comprising:

a crystalline semiconductor island on an insulating surface;

source and drain regions in said semiconductor island;

a channel forming region between said source and drain regions;

a gate insulating film adjacent to at least said channel forming region;

a gate electrode adjacent to said channel forming region having said gate insulating film therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said channel forming region is formed in a monodomain region which contains no grain boundary,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the p-channel thin film transistor has a mobility in a range of $200\text{-}400 \text{ cm}^2/\text{Vs}$ while the n-channel thin film transistor has a mobility in a range of $500\text{-}1000 \text{ cm}^2/\text{Vs}$.

111. (Twice Amended) A semiconductor device including an electro-optical device comprising:

an active matrix circuit portion including at least a first thin film transistor;
a peripheral driving circuit portion including at least a second thin film transistor;
said second thin film transistor comprising:
a crystalline semiconductor island on an insulating surface;
source and drain regions in said semiconductor island;
a channel forming region between said source and drain regions;
a gate insulating film adjacent to at least said channel forming region;
a gate electrode adjacent to said channel forming region having said gate insulating film therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said crystalline semiconductor island is formed in a monodomain region which contains no grain boundary,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of $200\text{-}400 \text{ cm}^2/\text{Vs}$ while the n-channel thin film transistor has a mobility in a range of $500\text{-}1000 \text{ cm}^2/\text{Vs}$.

117. (Twice Amended) A semiconductor device including an electro-optical device comprising:

an active matrix circuit portion including at least a first thin film transistor;
a peripheral driving circuit portion including at least a second thin film transistor;
said second thin film transistor comprising:

a crystalline semiconductor island on an insulating surface;
source and drain regions in said semiconductor island;
a channel forming region between said source and drain regions;
a gate insulating film adjacent to at least said channel forming region;
a gate electrode adjacent to said channel forming region having said gate insulating film
therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said channel forming region is formed in a monodomain region which contains no grain boundary cm^{-3} ,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm^2/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm^2/Vs .

123. (Twice Amended) A semiconductor device comprising:

a crystalline semiconductor island on an insulating surface;
source and drain regions in said semiconductor island;
a channel forming region between said source and drain regions;
a gate insulating film adjacent to at least said channel forming region;
a gate electrode adjacent to said channel forming region having said gate insulating film
therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said crystalline semiconductor island is formed in a monodomain region which contains no grain boundary,

wherein said semiconductor device has a S value of 0.03-0.3,

wherein said crystalline semiconductor island includes one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,

wherein the p-channel thin film transistor has a mobility in a range of 200-400 cm^2/Vs while the n-channel thin film transistor has a mobility in a range of 500-1000 cm^2/Vs .

129. (Twice Amended) A semiconductor device comprising:

a crystalline semiconductor island on an insulating surface;

source and drain regions in said semiconductor island;

a channel forming region between said source and drain regions;

a gate insulating film adjacent to at least said channel forming region;

a gate electrode adjacent to said channel forming region having said gate insulating film

therebetween,

wherein said crystalline semiconductor island includes carbon and nitrogen at a concentration not higher than $5 \times 10^{18} \text{ cm}^{-3}$, and oxygen at a concentration not higher than $5 \times 10^{19} \text{ cm}^{-3}$,

wherein said channel forming region is formed in a monodomain region which contains no grain boundary,

wherein said semiconductor device has a S value of 0.03-0.3,

wherein said crystalline semiconductor island includes

one of hydrogen and halogen element at concentration not higher than $1 \times 10^{20} \text{ cm}^{-3}$ for neutralizing point defects in the crystalline semiconductor island,

wherein the semiconductor device includes at least one selected from the group consisting of a p-channel thin film transistor and an n-channel thin film transistor,